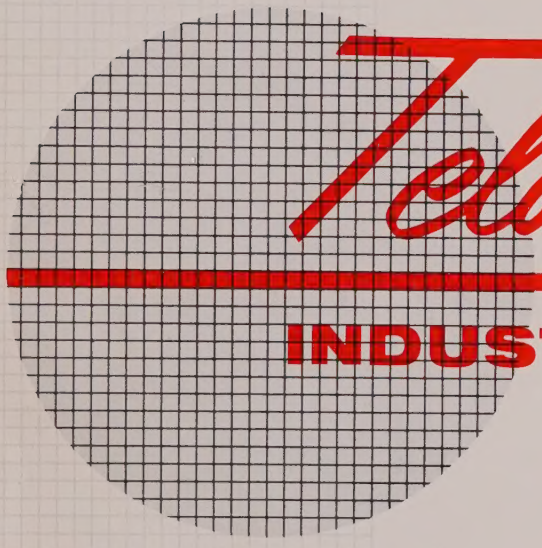
INSTRUCTION MANUAL

SERVICE DEPARTMENT

MASTER COPY

DO NOT REMOVE



Telonic

INDUSTRIES, INC

MODEL E-2 E-2M

SERIAL NO.

WARRANTY

TELONIC INSTRUMENTS AND ACCESSORIES

Products manufactured by TELONIC INDUSTRIES, INC. are guaranteed against defective materials and workmanship for a period of one year (vacuum tubes and semiconductors excepted) from date of purchase. This warranty does not apply to instruments that have been altered, improperly handled or damaged in any way beyond our control.

Instruments must be examined immediately upon receipt, since claims for damage in transit will not be honored by the carrier unless prompt action is taken.

CHANGES IN SPECIFICATIONS

The right is reserved to change the published specifications of equipment at any time, and to furnish merchandise in accordance with current specifications, without incurring any liability to modify equipment previously sold.

RETURNING EQUIPMENT TO FACTORY

Factory service is available for repair and readjustment of this instrument. However, a description of the trouble should be forwarded FIRST, whereupon instructions for correcting the trouble OR authorization for returning the equipment will be given. This applies to all units, whether under warranty or not.

MODEL E-2 / E-2M

SERIAL NO.

PLUG IN OSCILLATOR

2201E
6/63

CONVERSION INFORMATION

Commencing with equipment shipped after about July 22, 1963, certain modifications have been incorporated in the Telonic SM-2000 plug-in series, and in the Telonic SM-2000 control chassis. These modifications may render the units incompatible with those previously shipped unless the earlier instruments are modified also. The equipment in which these modifications have been made can be identified by the letter "A" prefixed to the serial number.

Units not so identified must be modified if they are to be compatible with instruments now being shipped. The modifications to be made are listed below, divided into two groups - those to be made to earlier SM-2000's and those to be made to earlier plug-ins.

SM-2000 CHANGES

1. On J601, remove all wires presently connected to pin 8 and reconnect them at pin 7; remove the jumper between pins 7 and 8.

2. Using shielded wire, type RG-174/U or equal, connect pin 8 of J601 to the printed circuit board land which leads to pin 1, V303. Ground the shield by connecting it to a convenient ground land nearby.

3. Prefix the letter "A" to the serial number of the instrument.

PLUG-IN CHANGES

1. On P601 remove all wires presently connected to Pin 8 and reconnect them at pin 7; remove the jumper between pins 7 and 8 if one is connected.

2. Prefix the letter "A" to the serial number of the instrument, if none is prefixed.

Changing the serial number of the instrument is as important in the modification as are the electrical requirements, as the ability to identify a unit as having been or not having been modified is involved.

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_07951

SECTION I .. SPECIFICATIONS

INTRODUCTION

The E-2 is a plug-in sweep oscillator for use with designated Telonic Control Chassis. The sweep ratio and sweep rate functions of the control chassis are not utilized with this unit. Outputs at the fundamental (RF 1) and second harmonic (RF 2) frequency of the sweep oscillator are provided.

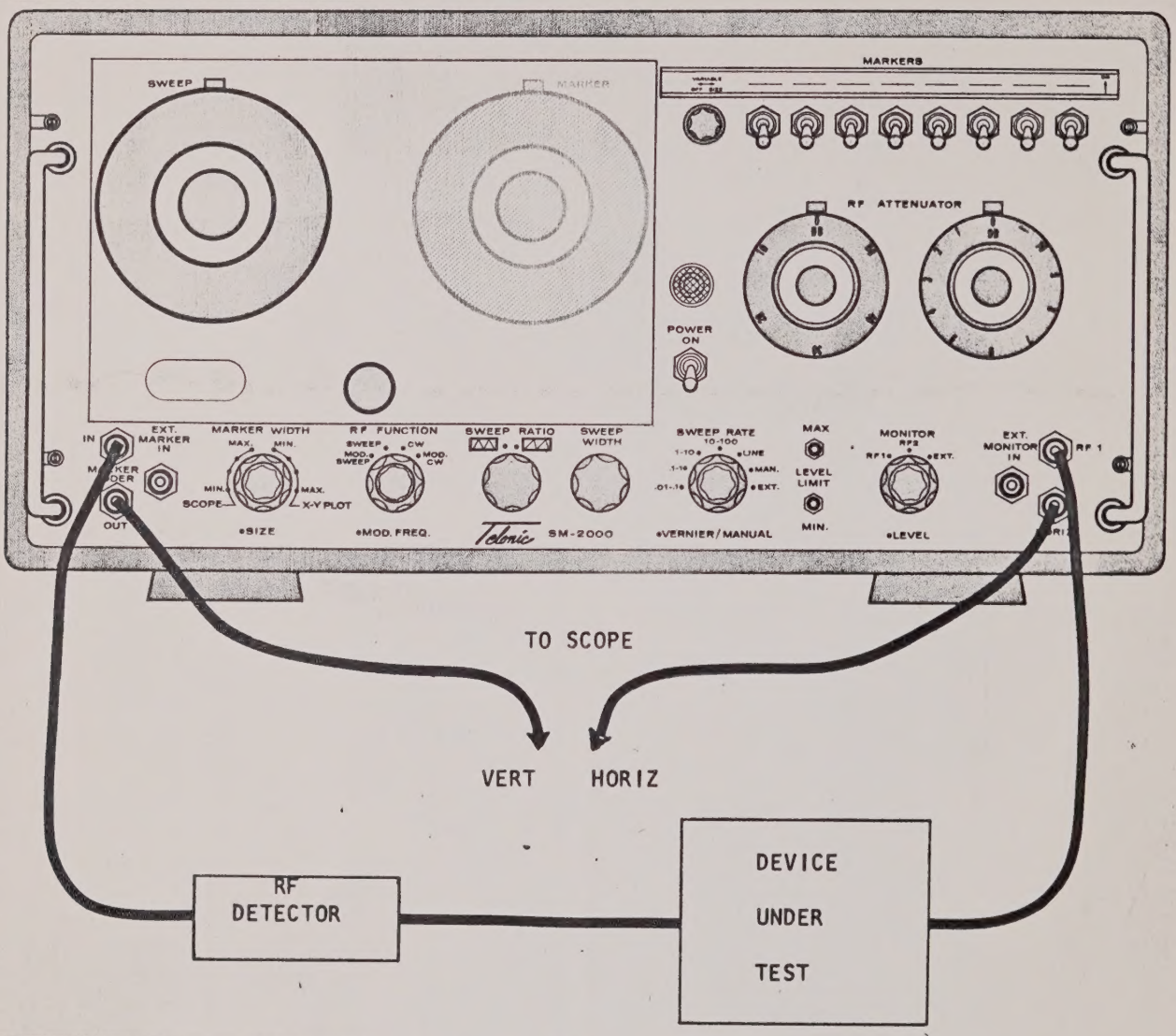
The E-2M includes a variable marker covering the entire sweep range. This difference is clearly indicated throughout the manual.

SPECIFICATIONS

	RF 1 OUTPUT	RF 2 OUTPUT
CW AND SWEEP CENTER FREQUENCY RANGE	600 - 1200 Mc	1200 - 2400 Mc
SWEPT FREQUENCY RANGE	570 - 1250 Mc	1140 - 2500 Mc
SWEEP WIDTH	0.02 - 10%	0.02 - 10%
OUTPUT VOLTAGE		
Sweep	1.0 vrms	0.25 vrms
Approximate CW Output	0.5 vrms	0.125 vrms
FLATNESS	±1.0 db	±1.0 db
LINEARITY	1.4:1 or better at 6% sweep width 1.6:1 or better at 10% sweep width	
VARIABLE MARKER (E-2M Only)		
Frequency Range	570 - 1250 Mc	1140 - 2500 Mc
Accuracy	0.25%	0.25%
VERNIER RF LEVEL CONTROL RANGE		
Sweep and CW Modes	0-6 db	0-6 db
Mod Sweep and Mod CW Modes	0-3 db	0-3 db

SECTION II .. OPERATING INSTRUCTIONS

TYPICAL SET UP



DESCRIPTION OF FRONT PANEL

SWEEP	The sweep dial, which sets the center frequency of the sweep oscillator by means of a variable capacitor.
MARKER	The variable marker dial, calibrated in two ranges to cover the full swept range of the unit. This control adjusts frequency by varying the length of a tuned line.
RF 2	The output at this connector is at the second harmonic of the sweep oscillator frequency.

GENERAL

1. Make sure the control chassis power is OFF before inserting the plug-in oscillator into the control chassis. If the power is ON, transient voltages may damage diodes in the units.

2. Disconnect the control chassis cable connecting the monitor block to the step RF Attenuators

3. Connect the cable from the low band monitor block on the E-2 directly to the step attenuator (upon removing the E-2, be sure to disconnect this cable to prevent damage).

4. Set the MONITOR switch on the control chassis to the RF 2 position. Set the MONITOR switch on the E-2 in the LO position for RF 1 output monitoring and in the HI position for RF 2.

5. Connect the device under test to the RF 1 output on the control chassis or to the RF 2 output on the plug-in oscillator as appropriate for the frequency range of the test circuit.

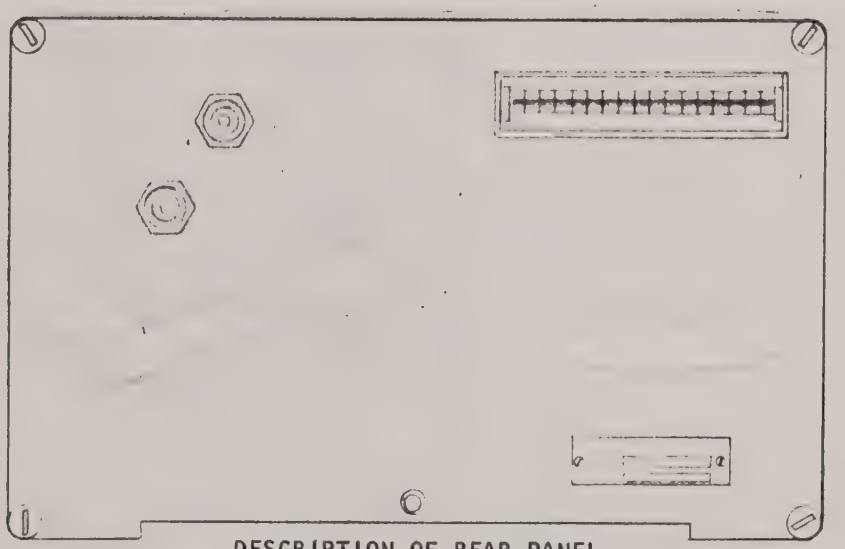
6. Refer to the manual for the Control Chassis for additional instructions. NOTE: To insure a constant amplitude output signal, the LEVEL MAX and MIN Controls should be set as prescribed in the control chassis manual and in the CALIBRATION PROCEDURE of this manual. These adjustments vary with the individual oscillator and with the output used.

7. To insure proper operation of both units, refer to Section IV (CALIBRATION PROCEDURE) of both manuals.

8. Proceed in accordance with recommendations of the manufacturer of the device under test concerning alignment, adjustment and tests.

*. See Telonic literature for suitable detector for this use.

DRAWING OF REAR PANEL



DESCRIPTION OF REAR PANEL

NOTE
For optimum performance on the RF 2 band, it is recommended that the fundamental (RF 1) output be terminated in its nominal 50Ω impedance. The RF 1 output can be considered effectively terminated when 20db or more of fixed attenuation is switched in with the RF ATTENUATOR on the front panel of the control chassis.

The three electrical connectors on the rear panel are:

Two BNC plugs, which mate with BNC jacks on the Control Chassis. These are the sweep sample output connector (RF 1 frequency) and variable marker (RF) output.

A 32-contact plug which makes the other electrical contacts necessary through a mating jack on the control chassis.

SECTION III

GENERAL DESCRIPTION

GENERAL

This plug-in oscillator has one RF output at the fundamental frequency of a tuned-line oscillator and another at the second harmonic. Center frequency tuning is accomplished by variable capacitors across the line.

The variable marker is produced by a CW oscillator which is tunable on the front panel. Variable tuned-line circuitry is used between plate and grid.

SWEEP OSCILLATOR

The sweep oscillator employs a Z-2869 ceramic-metal triode in a tuned line type oscillator circuit. The fundamental frequency of the sweep oscillator is the RF 1 output frequency indicated in the Specifications. The RF 2 output is the result of harmonic generation in a non-linear device. Center frequency tuning is accomplished by precision machined capacitors whose shaft is ganged to a tunable band-pass filter which automatically tracks the second harmonic of the sweep oscillator. The band pass of the tuned filter is over 10% of center frequency, thereby allowing sufficient coverage of the sweep oscillator at maximum sweep width with high enough Q to obtain up to 0.5 volts of the second harmonic output and to reduce the spurious output to practically zero.

A linear sweep (frequency change versus horizontal display) is provided by variable inductances which are sine wave mechanically driven by a motor secured at the base of the sweep oscillator assembly. Inductance change occurs when a silver strap mounted on a fiber glass cylinder vibrates and cuts the flux path of the tuned lines. The rate of vibration is fixed at 60 cycles (line frequency) and the amplitude is controllable by the control chassis and plug-in SWEEP WIDTH Controls. The position of this strap on the fiber glass cylinder and in relation to the tuned lines is carefully adjusted at the factory for optimum linearity and sweep width. Since a sine wave voltage is used to drive the motor and horizontal deflection plates of the oscilloscope, the frequency change versus horizontal deflection trace appearing on the scope represents the true linearity of the sweep oscillator.

The RF 1 signal is coupled to the RF 1 output connector on the Control Chassis front panel through a monitor block and the RF attenuators in the control chassis. The RF 2 output is coupled through the tuned band-pass filter and a monitor, both in the plug-in, to the connector on the front panel of the oscillator.

See the Control Chassis Manual for discussion of monitoring and leveling action.

VARIABLE MARKER (E-2M ONLY)

The variable marker oscillator uses a 6AF4 or 6DZ4 tube, and is tuned by adjusting its tuned lines. The tuning range of the marker is sufficient to cover the entire range of the sweep oscillator. A 5:1 vernier drives the marker dial which is individually calibrated to an accuracy of 1/4 of 1%.

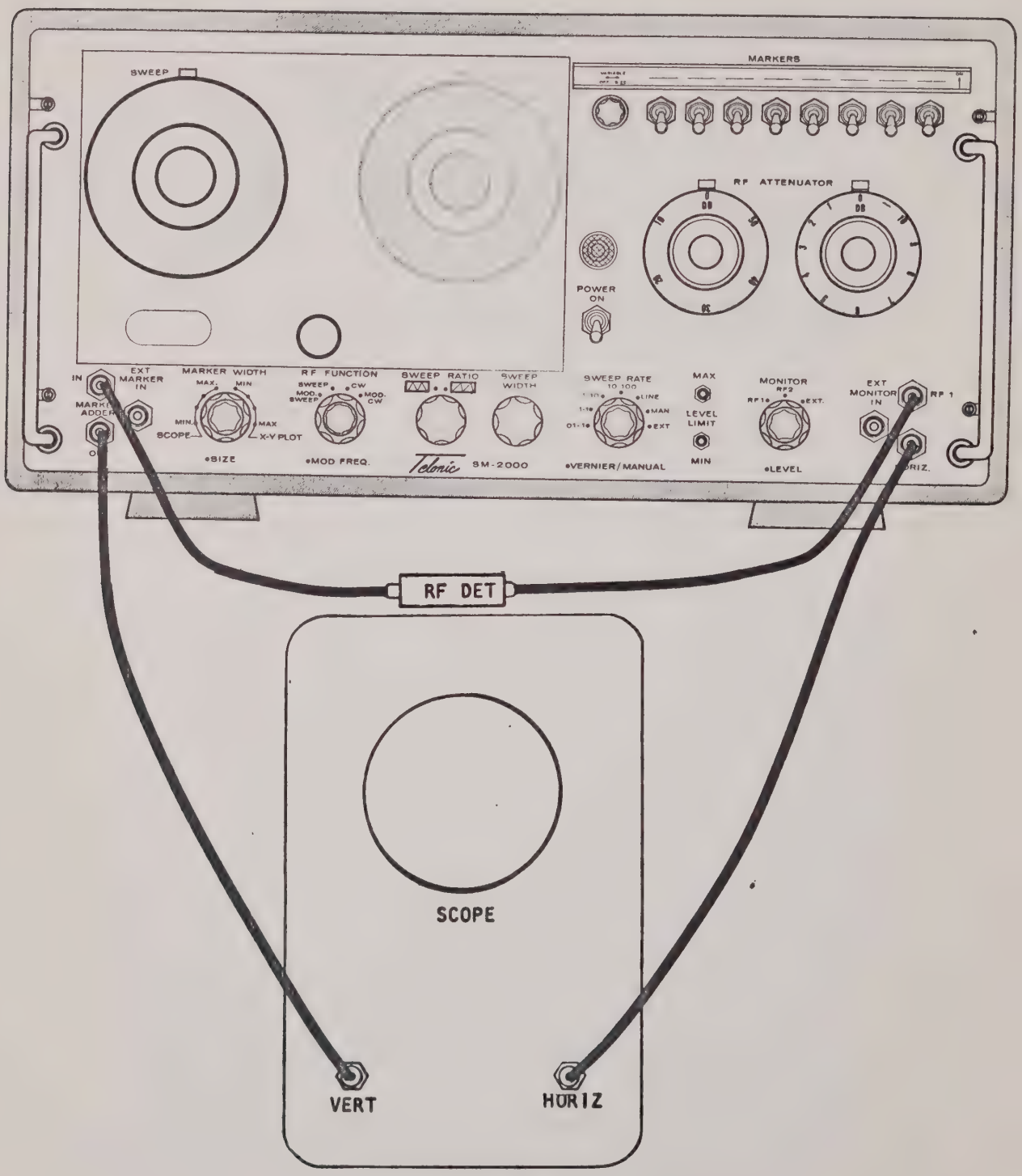
The output from the variable marker oscillator is then fed into a crystal diode mixer where it is mixed with a sample of the sweep oscillator signal. The resultant birdy is then fed into the birdy-by-pass amplifier.

FIXED MARKERS

The sweep sample fed to plug-in marker units is the fundamental (RF 1) oscillator output. This results in a marker at the fundamental frequency on the RF 1 output and at the second harmonic on the RF 2 output. Thus a 50 Mc harmonic marker unit will mark at 50 Mc intervals on the demodulated RF 1 response curve but at 100 Mc intervals on the RF 2 trace.

Similarly a fixed frequency marker will indicate the nominal frequency on the RF 1 trace and the second harmonic of that frequency on the RF 2 trace.

SECTION IV .. CALIBRATION PROCEDURE



TYPICAL SET UP

GENERAL

The following procedure should be applied after changing any component in the E-2 plug-in oscillator or at any time the calibration is noted to be incorrect.

Complete calibration of the E-2 involves adjustment of two classes of controls.

Those located in the E-2 which affect the operation of the control chassis.

Those located in the control chassis which affect the operation of the E-2.

NOTE: Although preliminary adjustments may be made with the cover removed from the oscillator section, final adjustment requires that the cover be in place. See chassis layout in schematic section for location of adjustments.

TEST EQUIPMENT

50 Mc harmonic marker (such as the Telonic Model CDH-50)
10 Mc harmonic marker (such as the Telonic Model CDH-10)
50Ω RF power meter
RF detectors (see Telonic literature for recommended detectors)
Oscilloscope

PROCEDURE

1. Make connections as shown.

2. Use double-shielded (RG) 50Ω cable for all RF connections to insure good connections and minimum radiation, and to avoid pickup of spurious signals. The detector must match the 50Ω cable, or a matching network must be used.

3. With power OFF, plug in the E-2 and secure in place.

4. Turn power ON, allow a 15 minute warmup period, and make adjustments as outlined.

SWEEP WIDTH (Adjustment)

This adjustment is set to provide 10% sweep width. A 10% setting at 1000 Mc assures sufficient sweep width over the full range.

Preset the following controls:

Control Chassis
- SWEEP WIDTH fully clockwise
- RF FUNCTION Switch to SWEEP
- MONITOR Switch to RF 1
- 10 Mc harmonic marker ON
- All other markers OFF

E-2
- Sweep Dial to 1000 Mc

CALIBRATION PROCEDURE

Adjust the E-2 SWEEP WIDTH Control for ten full marker intervals on the scope. This can be accomplished accurately by alternately adjusting the SWEEP dial and SWEEP WIDTH Control to place a marker at each end of the trace with nine markers between. Due to some non-linearity in the sweep, the SWEEP dial will not read exactly 1000 Mc at the conclusion of this adjustment.

BLANKING PHASE (Adjustment)

After the sweep width adjustment, this control is set for a rectangular pattern. Misadjustment will result in a pattern similar to the following:

HORIZONTAL PHASE (Adjustment)

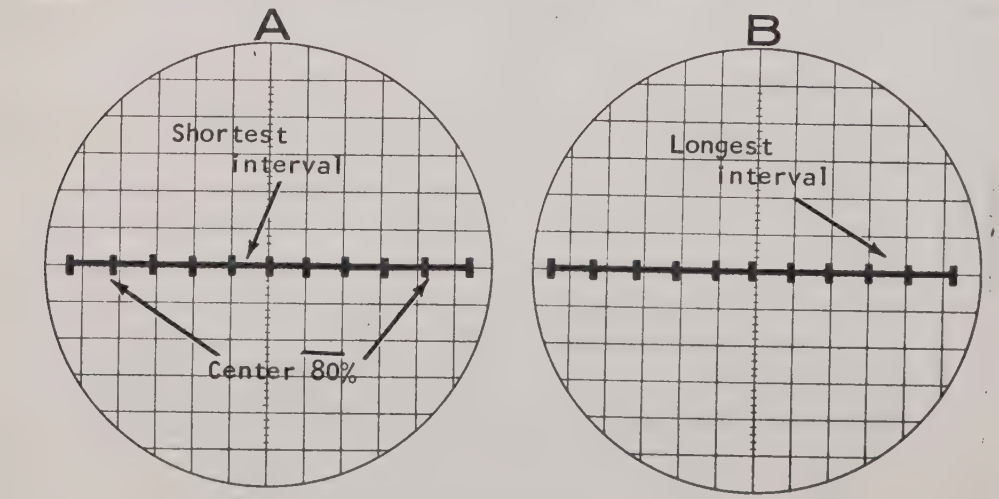
After completing the blanking phase adjustment, set this control for the best linearity possible, still maintaining a reasonable rectangular pattern. See LINEARITY CHECK below. If necessary, readjust the BLANKING PHASE Control following this adjustment:

LINEARITY CHECK

Linearity measurements are made over the center 80% of the display at 10% sweep width.

Leaving other controls set as at the conclusion of the HORIZONTAL PHASE adjustment, set the SWEEP dial for exactly 10 marker intervals on the oscilloscope. Set the horizontal gain of the oscilloscope for a 10 cm trace.

Locate the shortest marker interval in the center 80% of the display. Adjust the horizontal gain control on the scope so that this interval occupies exactly one scope division. See Figure A below. Locate the longest marker interval in the center 80% of the display. Adjust the horizontal position on the scope so that the interval begins on a graticule line. See Figure B below. Measure the marker interval. Its length (in scope divisions) indicates the linearity ratio: A length of 1.15 scope divisions for the longest marker interval represents a linearity of 1.15 to 1.



B+ LIMIT (Adjustment)

This control limits the maximum oscillator B+ to a safe operating level. It is set for rated RF output.

1. Connect the RF 1 output to a 50Ω RF power meter.

2. Preset the following controls:

   Control Chassis
   - RF FUNCTION Switch to CW
   - MONITOR Switch in EXT position
   - LEVEL fully clockwise
   - MAX LEVEL LIMIT for maximum output
   - RF ATTENUATORS to 0 db position

   Plug-In Oscillator
   - B+ LIMIT fully counter-clockwise
   - SWEEP Dial for frequency at which output is lowest

3. Adjust the B+ LIMIT for just over 5 mw output.

4. Connect the power meter to RF 2. Again use the SWEEP Dial to locate the minimum output. If this is less than 312.5μw, raise the B+ LIMIT setting enough to exceed this figure slightly.

   NOTE: No B+ LIMIT Control is used in the SWEEP, MOD SWEEP Modes.

MAX and MIN LEVEL LIMIT (Control Chassis)

The procedure outlined in the Control Chassis Manual for setting these controls is repeated here, with additional information peculiar to operation with the E-2.

The settings of these controls will be different for RF 1 and RF 2 outputs if a calibrated level is to be maintained. Thus, if the controls have been set for swept RF 1 output of 1.0 vrms and desired LEVEL Control range, it will be necessary to readjust these controls for RF 2 output of .25 vrms and desired range.

1. With the power meter connected to the desired output connector, set the RF FUNCTION Switch to SWEEP and adjust the MAX LEVEL LIMIT for 1.0 vrms (10 mw output).

2. Disconnect the power meter and reconnect scope and detector as shown in TYPICAL SETUP.

3. Insert fixed attenuation in an amount equal to the desired range (not exceeding 6 db) of the LEVEL Control. For the RF 1 output, the attenuators in the Control Chassis should be used. For the RF 2 output, the use of a fixed single-pad coaxial attenuator, flat over the RF 2 range, is recommended.

CALIBRATION PROCEDURE

4. Note the level of the scope pattern.

5. Remove attenuation, rotate LEVEL Control fully conter-clockwise. Set MIN LEVEL LIMIT for same scope deflection as seen in Step 4.

FLATNESS CHECK

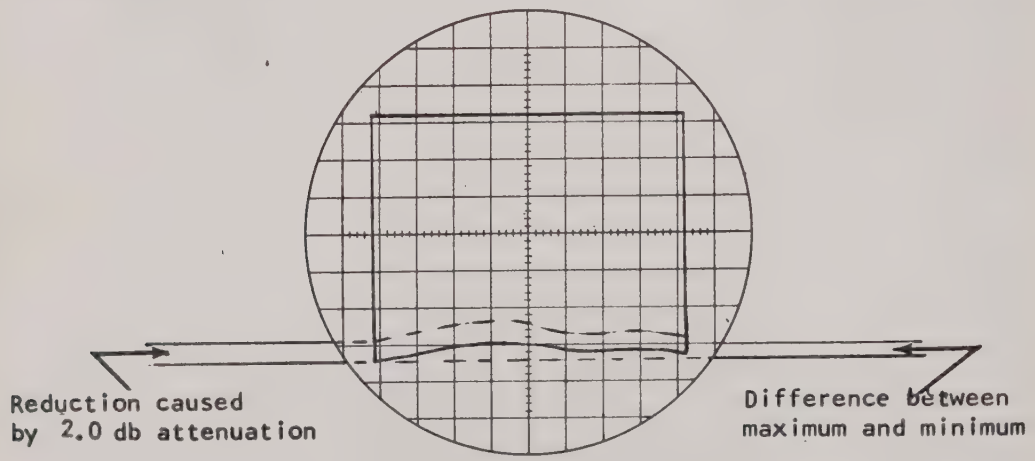
Flatness is measured over the full swept range of the E-2. Over this range, the minimum output must be no more than 2.0 db lower than the maximum.

1. With controls set as above, rotate the LEVEL and SWEEP WIDTH Controls fully clockwise, and set MONITOR SELECTOR to RF 1 (or RF 2).

2. Rotate the SWEEP Dial throughout the full swept range of the E-2.

3. Note the difference between maximum and minimum output levels.

4. Insert a known quantity of attenuation (preferably 2.0 db) and compare the reduction in output with the noted difference between maximum and minumum. With RF 2 output the attenuator should be similar to that described for such use in the preceding adjustment operation. The difference between maximum and minimum output must be no more than the signal reduction caused by 2.0 db of attenuation.



VARIABLE MARKER CHECK

Although there are no adjustable electrical components in the variable marker circuit to compensate for dial inaccuracies, the following procedure can be used to restore specified dial accuracy when tube replacement is necessary:

NOTE: All marker dial calibrations are made with the tube well-seated in the socket. If the tube is positioned otherwise, the high frequency end of the range will be shifted.

1. Obtain several 6AF4A tubes which have been aged several days with filaments continually burning.

2. Turn on both harmonic markers and the variable marker. Check the marker dial accuracy at the lowest frequency setting by superimposing the variable marker over the appropriate harmonic marker. If calibration at this point is incorrect, loosen the set screw holding the knob and dial assembly to the tuning shaft and rotate the dial to bring the proper dial mark under the indicator hairline.

3. Similarly check the marker dial accuracy at the highest frequency setting. If dial is inaccurate, select a tube from the aged stock which will restore accuracy at this point. Usually the effect of tube selection on the high frequency end is considerable, but negligible on the low frequency end.

4. Recheck each end of the range as above until best possible overall accuracy is obtained.

Factory recalibration service is also available.

SECTION V .. MAINTENANCE

GENERAL PROCEDURE

Since this is a plug-in unit, many of the possible malfunctions of the oscillator are the result of part failure in the control chassis. The connections at P601 of the plug-in oscillator and at J601 of the control chassis afford a convenient means of tracing the source of troubles to the oscillator or chassis.

In locating troubles which have been traced to the oscillator, application of the common rules of electronic maintenance, including a visual check for damage, open filaments, glowing anodes, shorted tuning capacitors, and charred resistors, is an obvious measure. All connectors, particularly P601 and J601 should be checked for cleanliness.

EXTENSION CABLE

For maintenance work requiring access to parts located on the under side of the plug-in or in other areas not easily reached, an extension cable may be obtained from Telonic Industries, Inc. This cable, having the 32-contact plug on one end and the 32-contact jack on the other, allows the oscillator to be removed from the control chassis and operated on the bench.

ACCESS TO RF COMPARTMENT

To take off the top cover of the oscillator compartment, remove the necessary screws. See photograph, Page 14.

> CAUTION: The red-lacquered screws securing the drive motor to the bottom of the compartment should not be disturbed. The position of this drive motor is critical, and these mounting screws are factory adjusted for optimum oscillator performance.

The following chart will be of service in deciding whether a trouble lies in the oscillator or control chassis.

SYMPTOM	CHECK (Pin Numbers Refer to P601)
Weak or no output or unleveled output	DC voltage at Pin 32 with RF LEVEL fully clockwise.
No sweep width	Resistance between Pins 27 and 9, 26 and 27, 26 and ground
No variable marker (plug-in marker present)	1. For birdy at Pin 17
	2. DC voltage at Pin 1

If the chart shows that the trouble probably is in the control chassis, refer to the MAINTENANCE Section of the manual for that unit. A common trouble is unleveled RF 1 output due to failure of the monitor diode in the control chassis. This part can be replaced as necessary by following the procedure outlined in the control chassis manual.

If the trouble appears to be in the plug-in, the following chart may be of assistance in localizing the failure.

SYMPTOM	CHECK
Both outputs weak, absent, or unleveled	V701 and associated components
No sweep width	Resistance, P601-26 to ground; R605
No variable marker	Feed an external CW source in the variable marker range to the control chassis EXT MARKER input and check for birdy. If none appears as the variable marker is tuned across the frequency of the external signal, the marker oscillator probably is inoperative. Check V801, then other components if necessary.

It is assumed that the above procedures have been applied and that the jumpers on P601 are intact. Where "inconclusive" is shown, the next step should be followed.

IF RESULT IS	TROUBLE PROBABLY IN OSCILLATOR	CONTROL CHASSIS
High 100-175v	X	
Low or zero 0-100v		X
Open between		
27 and 9	X	
26 and 27		X
26 and ground	X	
Continuity on all checks		X
Birdy present		X
No birdy	Inconclusive. See Check #2. ↓	
100v	X	
Low or no voltage		X

SCHEMATIC PART DESIGNATION

C	Capacitor
CR	Crystal Rectifier
J	Jack
L	Inductor
P	Plug
R	Resistor, Fixed or Variable
V	Tube
Z	Miscellaneous

SCHEMATIC VALUE ABBREVIATION

Ω	ohms
K	1,000 ohms
M	1,000,000 ohms (megohms)
µf	Microfarad
pf	Picofarad
µh	Microhenry
mh	Millihenry

OTHER ABBREVIATIONS

F.P.	Front Panel
R.P.	Rear Panel
T.P.	Test Point

RESISTORS - All resistors are 1/2 watt, ± 10%, and are shown in ohms, unless otherwise specified.

CAPACITORS - All capacitors are shown in picofarads (pf) unless otherwise specified.

COILS - All inductors are shown in microhenries (µh) unless otherwise specified.

CIRCUIT REFERENCE SYMBOL - LOCATION INFORMATION

601 - 699	Interconnecting elements	701 - 799	Sweep Oscillator
		801 - 899	Variable Marker

*Indicates value of component adjusted at factory, and may deviate from value shown on print.

SECTION VI .. PARTS LIST

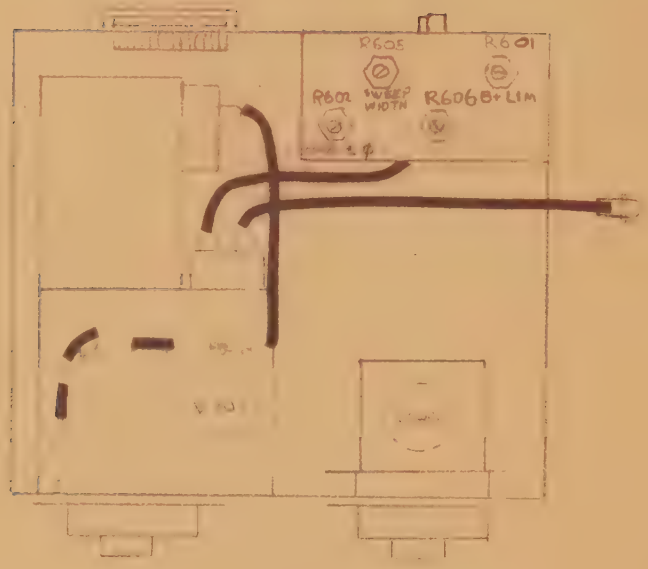
CIRCUIT REF.	DESCRIPTION	TELONIC PART NO.
C601	CFM, 0.1 µf, ±20%, 200 VDCW	C-200
C602	CFE, (SC)	NA
C701, C702	CVA (Part of L701 & L702)	NA
C703	CFT (SC)	NA
C704-C708	CVA (Part of L704 - L708)	NA
C709-C711	CFCF, 1000 pf, ±20%, 500 VDCW	C-89
C712	CFMI, 500pf, ±10%, 500 VDCW	C-86
C713	CFT (SC)	NA
C714	CFN, 0.5 pf, ±10%, 500 VDCW	C-29
C715	CFN, 0.18 pf, ±10%, 500 VDCW	C-31
C716	CFMI, 300 pf, ±10%, 500 VDCW	C-87
CR701	DS, 1N25A	D-8
CR702	DS, 1N34A	D-2
CR703	DS, 1N21B	D-3
J701	RJ	J-31
J702	JC	J-55
J703, J704	RJ, UG-535/U	J-6
P701	PC, UG-536/U	J-52
P702	PC, 4961-1	J-27
P703-P705	PC, UG-88B/U	J-32
L701, L702	IF, Tuned Line	NA
L703	IF, Coupling Strap	NA
L704-L708	IF, Tuned Line	NA
L709	IF (SC)	NA
L710	IF (SC)	NA
L711	IF (SC)	NA
L712	IF, 1 µh	L-102
R601, R602	RVC, 50KΩ, 2W	R-751
R605	RVW, 25Ω, 2W	R-713
R606	Same as R601	
R607	RFC, 10KΩ, ±10%, 1/2W (SC)	R-23
R608	RFC, 220KΩ, ±10%, 1/2W	R-44
R701	RFC, 47Ω, ±10%, 1/2W (SC)	R-55
R702	RFC, 3.3KΩ, ±10%, 1/2W	R-70
R703	(SC)	NA
R704	RFC, 220Ω, ±10%, 1/2W	R-39
R705	RFC, 100KΩ, ±10%, 1/2W	R-28
R706, R707	RFC, 16.7Ω, ±2%, 1/2W	R-1120
R708	RFC, 66.7Ω, ±2%, 1/2W	R-1121
R709, R710	RFC, 120Ω, ±10%, 1/2W	R-16
R711	RFC, 51Ω, ±5%, 1/2W	R-3
V701	TE, Z-2869	VT-38
Z701	Filter, Low pass	06032
Z702	Drive Motor	09106

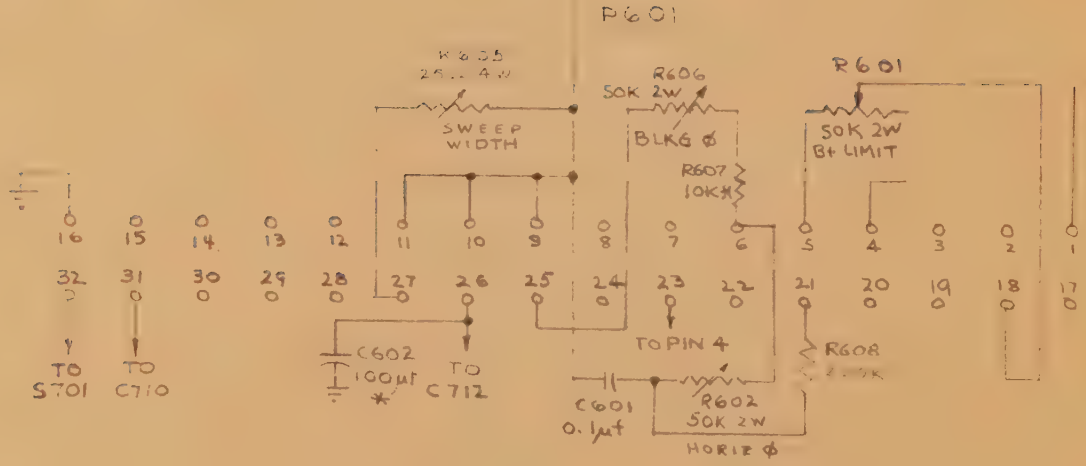
VARIABLE MARKER (E-2M ONLY)

CIRCUIT REFERENCE	DESCRIPTION	TELONIC PART NUMBER
C801	CFC, 10 pf, ±10%, 1000 VDCW	C-6
C802	CFN, 0.36 pf, ±10%, 500 VDCW	C-30
C803	CFC, 3 pf, ±10%, 1000 VDCW	C-2
C804 - C807	CFCF, 1000 pf, +100-0%, 500 VDCW	C-110
J801	TC, MX-1684/U	J-9
P801	PC, UG-536/U	J-52
L801	IV, Tuned Line	SM-3
L802	IF (SC)	NA
L803	IF (SC)	NA
R801, R802	RFC, 2.2KΩ, ±10%, 1/2W	R-20
R803	RFC, 56Ω, ±10%, 1/2W	R-13
R804	Same as R803	
R805	RFC, 1KΩ, ±10%, 2W	R-302
V801	TE, 6AF4A	VT-4

ABBREVIATION CODE

CFP	Capacitor, fixed, paper
CFC	Capacitor, fixed, ceramic
CFCF	Capacitor, fixed, ceramic feed-thru
CFE	Capacitor, fixed, electrolytic
CFM	Capacitor, fixed, mylar
CFMI	Capacitor, fixed, mica
CFN	Capacitor, fixed, composition
CFT	Capacitor, fixed, Teflon
CVA	Capacitor, variable, air
DS	Diode, semiconductor
IF	Inductor, fixed
IV	Inductor, variable
JC	Jack, cable
NA	Not assigned
PC	Plug, cable
RFC	Resistor, fixed, composition
RJ	Receptacle, jack
RVC	Resistor, variable, composition
RVW	Resistor, variable, wirewound
SC	This part subject to change
TC	Terminator, cable
TE	Tube, electron





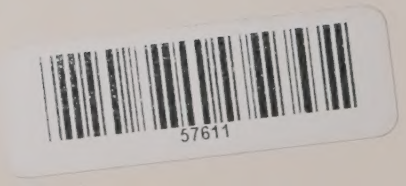
EZM
10/15/62
2271E

REV. 1 (6/12/63)
5A

PRODUCTION CHANGES
TELONIC MODEL E-2

The following changes to this equipment are effective with units shipped on or after effective date shown.

CIRCUIT OR FEATURE	CHANGES	EFFECTIVE DATE
Variable Marker	Add 2.2μh inductor in each filament lead, Telonic Part No. L-101	September 1, 1962
Variable Marker	Add 2.2 μh inductor in cathode lead, Telonic Part No. L-100	September 1, 1962


57611